

NISTTech

Portable Fourier Transform Microwave Spectrometer with Cryogenic Receiver for Trace Gas Analysis

Description

The invention comprises a highly compact, portable, pulsed molecular-beam Fabry-Perot cavity Fourier transform microwave spectrometer which incorporates a cryogenically-cooled, low-noise amplifier in the receiving system that has been developed for trace gas analysis. The instrument design offers real-time analysis of trace-gas species in the parts per billion (volume) range. A user-friendly software package which employs a Graphical User Interface (GUI) has been written that allows complete mouse-driven instrument control with a standard 80486 processor based personal computer.

Applications

- **Analysis:**
Identifies trace gas, and concentration in a gas mixture

Advantages

- **Features include:**
Sensitive, 100ms detection limits; user friendly software; compact and portable

Abstract

A highly compact, portable, pulsed-molecular-beam Fabry-Perot cavity Fourier transform microwave spectrometer which incorporates ultra-fine Fabry-Perot mirror surface finishes has been developed for trace gas analysis. The mirrors, having a surface finish of less than or equal to 0.25 microns rms, are coated with nickel and then with either gold or silver. In a further embodiment, one or more fixed-tuned Fabry-Perot cavities are incorporated within a single vacuum chamber to monitor one or more chemical species of interest.

Inventors

- Grabow, Jens-Uwe
- Harmony, M.
- Leonov, Igor I.

- Lovas, Frank J.
- Suenram, Richard D.
- Zuban, Andrei V.

References

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Status of Availability

This invention is available for licensing.

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